Notice of Allowability	Application No.	Applicant(s)
	09/557,250	GOLDICK ET AL.
	Examiner	Art Unit	
	Haresh Patel	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *3/31/04*.

2. ☒ The allowed claim(s) is/are *1-13, 16-20, 22-27,_____* .

3. ☒ The drawings filed on *24 April 2000* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some*   c)☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the

            International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**
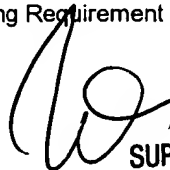
5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a)☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1)☐ hereto or 2)☐ to Paper No./Mail Date _____ .

    (b)☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of

        Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application (PTO-152)

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *10* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes and/or

additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR

1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the

payment of the issue fee.

2.   Authorization for this examiner's amendment was given in a telephone interview with

Richard W. Knight on May 14, 2004.

3.   The application has been amended as follows:

This listing of claims replaces all prior versions, and listings, of claims in the application.

Listing of Claims:

1.   (currently amended) A method for utilizing application's state dependency information in relation to other applications to efficiently perform a backup service operation in a computer system, comprising the acts of:
        registering applications loaded in said computer system with an application dependency application programming interface (API) for communications of application's state dependency information in relation to other said [among] applications, a common software agent, a storage component utilized by said agent and a backup service;
        said agent capturing and storing said dependency information in said storage component [at least one application's dependency information]; and
        communicating said [application] dependency information from said storage component to said backup service for backup.

2.   (original) A method as recited in claim 1, wherein said backup service includes a snapshot service.

3.   (original) A method as recited in claim 1, wherein said backup service includes a determination of an application freeze order.

4.   (original) A method as recited in claim 3, wherein said backup service includes an execution of the freezing of applications in the order reflected by the determined application freeze order.

5.   (original) A method as recited in claim 1, further comprising the act of loading said application dependency application programming interface (API) into said computer system.

6.   (original) A method as recited in claim 1, further comprising the act of said backup service requesting a set of application dependency information from a common software agent for use in connection with the restore operation.

7.   (original) A method as recited in claim 6, wherein said set of application dependency information is the minimum set of information from said storage component for successfully completing the restore operation.

8.   (original) A method as recited in claim 6, further comprising the act of said agent issuing a request to at least one registered application for information from said set of application dependency information requested by the service.

9.   (original) A method as recited in claim 1, further comprising the act of at least one registered application communicating information to said agent in response to a request by said agent, said information relating to said at least one application's external dependencies.

10.   (original) A method as recited in claim 1, further comprising the act of unregistering an application.

11.   (original) A method as recited in claim 1, wherein said API protocol is XML protocol.

12.   (original) A method as recited in claim 1, wherein said agent stores said application dependency information in a tabular format reflective of hierarchical application dependencies in said storage component.

13.   (currently amended) A computer-readable medium having computer-executable instructions for instructing a client computer to perform the acts of a method recited in claim 1.

14.   (canceled)

15.   (canceled)

16.   (currently amended) An application programming interface (API) embodied in a computer readable media having computer executable instructions for use in a computer system, wherein said API enables an agent to collect, store and package information about application's state dependency[ies] in relation to other loaded [among] applications in said system in response to a request by a service for backup, and thereafter delivers said [application] dependency information to said service for further processing by said service.

17.   (original) An API as recited in claim 16, wherein the service to which said agent delivers said information is a backup service.

16.   (original) An API as recited in claim 16, wherein said service includes a snapshot service.

17.   (original) An API as recited in claim 16, wherein said service includes a determination of an application freeze order.

18.   (original) An API as recited in claim 16, wherein said agent stores said application dependency information in a tabular format reflective of hierarchical application dependencies in a storage component.

19.   21. (Canceled)

22.   (currently amended) A computer system, comprising:

a plurality of applications loaded in said system, wherein at least one said application has at least one of it's external [data] state dependency with other said applications associated therewith;

a storage component [for storing application dependency information];

an agent that functions according to communication protocols of an application programming interface (API) in said system for processing said [application] dependency information, [wherein said application dependency information includes information about dependencies among applications executing on the system,] to communicate[d] said dependency information to said API from said agent and for storing said [the application] dependency information in said storage component; and

a service for making requests to said agent for a set of said [application] dependency information for backup, wherein said agent collects, stores and packages said application dependency information in response to a request by [a] said service, and delivers said set of [application] dependency information to said service for further processing by said service.

20.   (original) A computer system as recited in claim 22, wherein the service to which said agent delivers said information is a backup service.

21.   (original) A computer system as recited in claim 22, wherein said service includes a snapshot service.

22.   (original) A computer system as recited in claim 22, wherein said service includes a determination of an application freeze order.

23.   (original) A computer system as recited in claim 22, wherein said agent stores said application dependency information in a tabular format reflective of hierarchical application dependencies in a storage component.

24.   (original) A method as recited in claim 22, wherein said set of application dependency information is the minimum set of information from said storage component for successfully completing the service.

DETAILED ACTION

4.   The amendment on May 14, 2004 is noted and made of record.

5.   Claims 1-13, 16-20, 22-27, are presented for examination. Claims 14, 15 and 21 are

cancelled.

Allowable Subject Matter

6.   Claims 1-13, 16-20, 22-27, are allowed.

7.   The following is an examiner's statement of reasons for allowance:

Applicant's invention discloses a method, a system and an API (application programming

interfaces) for using an agent to collect an application's state dependency information in relation

to other applications loaded on the system, to package, and to forward the collected dependency

information to a backup service for backup.

The cited teaching helps recover computer systems that may enter an unstable, frozen or

crashed state. An API keeps track of the application's state dependency information in relation

to other applications loaded on the system. The dependency information is captured at the same

time for given volume(s) or object(s). With the dependency information, the computer system

knows not only which loaded applications and in which order to freeze or flush the applications

dependency information with a backup, i.e., a snapshot, or restore of given volume(s) or

object(s), but also knows which volume(s) or object(s) can be excluded from the freezing

process. After a request by the service for dependency information for backup, the computer

system can translate or process dependency information, thereby ordering recovery events over a

given set of volumes or objects. The applications can communicate their external dependency

information, i.e., application's state dependency information in relation to other applications loaded on the system, to an agent having a storage component, thereby maintaining a table, list or other organized information relating to the dependency information for a consistent point in time. This table, list or other organized information can be used as part of a backup / restore service to recover the computer system from an unstable, frozen or crashed state.

The prior art at best, teaches collection of an application's state dependency information in relation to other data objects loaded on the system, packaging, and then forwarding the collected dependency information to a backup service for backup and to recover the computer system from an unstable, frozen or crashed state. These prior arts do not teach an agent to collect an application's state dependency information in relation to other applications loaded on the system for the backup service for backup and to recover the computer system from an unstable, frozen or crashed state. Therefore, the claims are allowable over the art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Haresh Patel whose telephone number is (703) 605-5234. The examiner can normally be reached on Monday, Tuesday, Thursday and Friday from 10:00 am to 8:00 pm.

JOHN FOLLANSBEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Follansbee, can be reached at (703) 305-8498.

The appropriate fax phone number for the organization where this application or

proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 305-3900.

Haresh Patel

May 23, 2004